



# United States Department of the Interior

GEOLOGICAL SURVEY  
P. O. Box 26124  
Albuquerque, New Mexico 87125

Confidential Claim Retracted

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Report of Examination  
Sohio Natural Resources Company  
Sohio Western Mill  
Valencia County, New Mexico

On October 30, 1980, the writer, accompanied by John M. Andrews, Jr., Environmental Scientist, USGS, and Art Degonhart, Metallurgic Supervisor, Sohio Western examined the captioned uranium milling facilities. The purpose of this examination was to observe the procedures used to weigh, sample, and assay the uranium ore delivered to the mill from the Anaconda Copper Company's Jackpile-Paguate Mine, located on the Laguna Indian Reservation. The tonnages and grades determined at the mill are used to calculate the royalties due the Pueblo of Laguna.

Anaconda conducts both open-pit and underground mining at the Jackpile-Paguate Mine. The ore from these operations is placed in mine stockpiles according to grade (percent U<sub>3</sub>O<sub>8</sub>) as determined by scanners (scintillometers) at the mine. The ore was then transferred from these mine stockpiles into highway haulage trucks for shipment to the Sohio Western Mill. Anaconda no longer has their ore toll-milled by Sohio Western.

Upon arrival at the mill, each highway haulage truck is weighed, both loaded and empty, on the mill's truck scales to determine the wet weight of ore contained. Each highway haulage truck holds between 25 and 30 tons of ore. The trucks then dump the ore into stockpiles on the ore storage pad. Each stockpile is designated a lot and given a separate lot number. These lots contain approximately 3,000 tons of ore. The mill truck scales are tested once a year by the New Mexico State Department of Agriculture.

The moisture content of all ore is determined at the mill laboratory by Sohio personnel using standard analytical techniques. Upon arrival at the mill, a five-pound grab sample is taken from every other truck, and placed into sealed buckets. These buckets are taken to the laboratory where a one kilogram cut is placed in an oven and heated for 24 hours to drive off the moisture. The cut is then weighed to determine the dry weight, and then compared to the wet weight to determine the moisture content. To determine the moisture content of the ore trucked in, the weighted average moisture content of the ore sampled (by company) is taken for each day. This average is then applied to the ore which was trucked in that day by each company from each property.



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As each lot is fed to the mill, the ore must pass through a grizzly to separate out the oversized material. Sohio does not have a crusher, so their mill cannot handle material larger than one foot. All oversize material is set aside (by company) and, at the end of each month, it is weighed on the mill truck scales. This weight is then deducted from the monthly tonnage to determine the tons of ore milled.

The ore that passes the grizzly goes to a semi-autogenous, wet-grinding mill in closed circuit with two cyclones. The cyclone discharge is the mill feed pulp, and passes through an automatic, continuous sampler before entering the mill leach circuit. This sampler takes a double cut of feed pulp every three minutes, resulting in four or five gallons of pulp sample for each shift. The Sohio Mill consumes about 500 tons per shift, giving five to six samples per lot. The average grade for each lot is determined by combining the daily samples (three shifts) into a composite sample. A 2,000 gram dry-cut is taken from this composite sample, and is assayed. This assay becomes the daily average grade. The daily average grades for the days that the lot is milled (two to three days) is combined to determine the grade for that lot. The 2,000 gram cut is assayed by Sohio and Anaconda, with an umpire sample being kept in case of disagreement. If the Sohio and Anaconda assays are within .005 percent, the assays are averaged. If the assays are not within .005 percent, each company re-assays their cut, then if they still do not agree, the umpire sample is sent to an independent assayer. The independent assayer's results are then used. (Sohio and Anaconda have not had a disagreement over the assays.)

To determine the amount of yellowcake owed Anaconda, Sohio and Anaconda run amenability tests to determine the mill efficiency for each lot. The mill efficiency for the ore from the Jackpile-Paguate Mine has ranged from 82 to 90 percent. The mill efficiency is then multiplied by the pounds uranium contained in the ore milled to determine the pounds of yellowcake owed Anaconda.

During this examination, I found that Anaconda has not retrieved the oversize material. Sohio estimates that 1,000 tons of oversize material is stockpiled on the millsite. At the time of this examination, it was unknown whether or not Anaconda had paid royalties on this material.

Anaconda was contacted, and it was found that the base royalty has been paid on the basis of the tons of ore trucked to the mill (i.e., tons milled plus oversize material). The additional royalty has been paid on the amount of yellowcake that would have been recovered from the ore trucked to the mill, even though all the ore was not

milled. Anaconda stated that the oversize material presently stockpiled on the millsite is low-grade, clayey material, and waste. All ore grade oversize material was broken to millable size with a headache ball, and then milled. This was done as a one-time operation.

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